CLAIMS

1. A method of controlling an ablation volume depth during surface treatment of a target tissue site, the method comprising:

providing a tissue surface treatment apparatus, the apparatus comprising a housing having a proximal end and a distal end including a tissue contacting surface having an aperture, the housing defining an interior; an energy delivery device positionable in the housing interior, the energy delivery device including at least one electrode with a tissue penetrating distal end, the at least one electrode configured to be advanced from the housing interior through the aperture and into a target tissue site to define an ablation volume at least partly bounded by the tissue surface; an advancement device coupled to the energy delivery device, the advancement device configured to advance the at least one electrode from the housing interior to a selected deployment depth;

positioning the tissue contact surface on a target tissue surface;

advancing the at least one electrode to the selected deployment depth beneath a tissue surface while avoiding a critical structure;

delivering ablative energy from the energy delivery device;

creating an ablation volume at a controlled depth below the tissue surface responsive to the electrode deployment depth; and

minimizing injury to the critical structure responsive to the electrode deployment depth.

2. The method of claim 1, further comprising:

controlling the deployment depth of the at least one electrode using one of the advancement device or a stop coupled to one of the advancement device, the housing or the at least one electrode.

3. The method of claim 1, wherein the at least one electrode includes a first and a second electrode, the first and second electrodes being independently positionable, the method further comprising;

positioning the first electrode at a first selectable deployment depth;

positioning the second electrode at a second selectable deployment depth independent of the first depth;

defining an ablation volume utilizing the first and the second deployment depths.

4. The method of claim 3, further comprising:

positioning one of the first or the second electrodes to avoid or minimize injury to the critical structure.

5. The method of claim 1, wherein the at least one electrode includes a sensor, the method further comprising:

positioning the at least one electrode responsive to an input from the sensor.

6. The method of claim 1, wherein the apparatus is configured to be advancable within an introducer including a lumen, the method further comprising:

positioning the introducer proximate to the tissue site;

advancing the apparatus through the introducer lumen to the tissue site.

7. The method of claim 6, wherein at least a portion of the apparatus has a non-deployed state and a deployed state, the at least a portion of the apparatus configured to be advancable through the introducer lumen in the non-deployed state and positionable on the tissue surface in the deployed state, the method further comprising;

advancing the apparatus through introducer lumen in the non-deployed state;

deploying the apparatus to the deployed state to at least partially engage the tissue contacting surface with the tissue surface.

8. The method of claim 1, wherein at least a portion of the housing or tissue contact surface is deflectable or conformable, the method further comprising:

conforming or deflecting one of the housing or the contact surface to at least partially correspond to a tissue surface contour.

9. The method of claim 8, wherein the apparatus includes a deflection mechanism coupled to one of the tissue contact surface or the housing, the deflection mechanism including an actuating mean configured to allow remote deflection of the housing or tissue contact surface, the method further comprising:

deflecting or bending the tissue contact surface or housing utilizing an actuating means positioned externally to the target tissue site or tissue surface.

10. A method of surface treatment of a target tissue site, the method comprising:

providing a tissue surface treatment apparatus, the apparatus comprising an expandable member including a tissue contacting surface and an energy delivery device, the expandable member having a non-deployed state and an expanded or deployed state, the energy delivery device including at least one electrode with a tissue penetrating distal end, the at least one electrode being advanceable by or through the expandable member to a selected deployment depth within target tissue site to define an ablation volume at least partly bounded by the tissue surface;

positioning the apparatus at the target tissue site;

deploying the expandable member to at least partially engage the target tissue surface;

advancing the at least one electrode to the selected deployment depth beneath a tissue surface while avoiding a critical structure;

delivering ablative energy from the energy delivery device;

creating an ablation volume at a controlled depth below the tissue surface responsive to the electrode deployment depth; and

minimizing injury to the critical structure responsive to the electrode deployment depth.

11. The method of claim 10, further comprising:

utilizing the expandable member to advance the at least one electrode.

12. The method of claim 10, further comprising:
utilizing the expandable member to control the deployment depth of the at least one electrode.

13. The method of claim 10, further comprising:
expanding the expandable member to at least partially stabilize or immobilize the target tissue surface.

14. The method of claim 10, further comprising:
expanding the expandable member to at least partially stabilize or immobilize a tissue contacting surface of the expandable member with respect to the tissue surface.

15. The method of claim 10, further comprising:
expanding the expandable member to apply a substantially uniformly distributed force over an interface between the expandable member and the target tissue surface.

16. The method of claim 15, further comprising:
uniformly stabilizing or immobilizing the tissue surface at an interface between the expandable member and the tissue surface.

17. The method of claim 10, wherein the apparatus is configured to be advancable within an introducer in the non-deployed state and

deployable from the introducer in the expanded state, the method further comprising:

advancing the expandable member through the introducer lumen in the non-deployed state;

positioning at least a portion of the expandable member outside of a distal end of the introducer;

expanding at least a portion of the expandable member to the deployed state.

18. The method of claim 10, wherein the at least one electrode includes a sensor, the method further comprising:

positioning the at least one electrode responsive to an input from the sensor.

19. The method of claim 10, wherein at least a portion of the expandable member includes a fluid strut, the method further comprising:

inflating the fluid strut to deploy the expansion device.

20. A method of controlling an ablation volume depth during surface treatment of a target tissue site, the method comprising:

providing a tissue surface treatment apparatus, the apparatus comprising a housing having a proximal end and a distal end having a tissue contact surface configured to at least partially immobilize the tissue surface, the housing defining an interior; an energy delivery device positionable in the housing interior, the energy delivery device including at least one electrode with a tissue penetrating distal end, the at least one electrode

configured to be advanced from the housing interior to a selected deployment depth in a target tissue site to define an ablation volume at least partly bounded by the tissue surface;

positioning the tissue contact surface on a target tissue surface;

at least partially immobilizing the tissue surface utilizing the tissue contact surface;

advancing the at least one electrode to the selected deployment depth beneath a tissue surface while avoiding a critical structure;

delivering ablative energy from the energy delivery device;

creating an ablation volume at a controlled depth below the tissue surface responsive to the electrode deployment depth; and

minimizing injury to the critical structure responsive to the electrode deployment depth.